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Bidessus rogersi, NEW WATER BEETLE FROM FLORIDA

(Coleoptera; Dytiscidae)

FRANK N. YOUNG[1]

The original series of the small *Bidessus* described below was collected from the burrows of a crawfish *(Cambarus rogersi* Hobbs) in wet flatwoods about nine miles northwest of Blountstown, Calhoun County, Florida. However, no specimens were found in burrows not directly connected with the surface, so that this peculiar habitat seems to be fortuitous. At the time when we collected the flatwoods were more or less flooded; a shallow pool covered the entire surface and the beetles were probably concentrated in the open burrows because of the protection afforded by the deeper water. Additional specimens were taken in a swamp stream about seven miles northwest of Blountstown, and the rest of the specimens before me came from a small pool in wet flatwoods similar to the original locality, but east of the Apalachicola River and about three miles south of the Leon-Wakulla County line in Wakulla County, Florida. I can detect no significant differences in the specimens from the three localities, and it is probable that the species extends across the area between the Ochlochnee and Apalachicola rivers and into the adjacent territory wherever suitable habitats occur.

Bidessus rogersi sp. n.

(Fig. 1; genitalia fig. 1a, 1b, 1c)

Diagnosis: Superficially very similar to *Bidessus granarius* (Aubé), fig. 2, from which it may be distinguished by its smaller size, more narrowly ovate form, finer and denser elytral punctation, less strongly reflexed and carinate edges of the elytra above the epipleurae, and the subequal thoracic and elytral plicae. The color pattern, general shape, and genitalia (see figures) seem to indicate a close relationship between the two species. The color pattern, punctation, general shape, and size will distinguish the present form from other North American species of the genus. The thoracic

[1] Contribution from the Department of Biology, University of Florida, Gainesville.

and elytral plicae vary somewhat in relative length, but they are more nearly subequal than in *granarius*. I have been unsuccessful in separating the males and females on external characters. The anterior tarsi of the male seem to be slightly more dilated than in the female, but the difference is very slight.

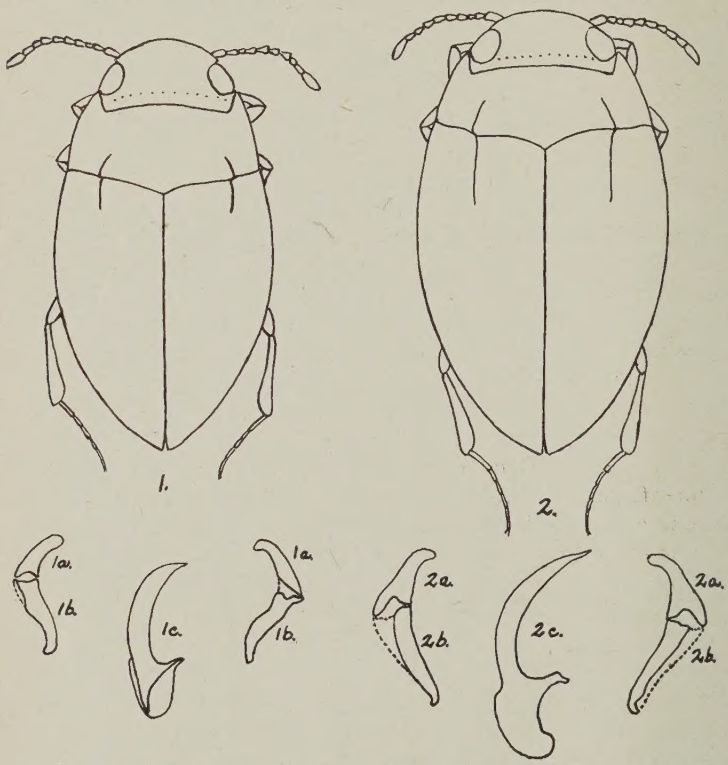

Fig. 1.—*Bidessus rogersi*, sp. n., dorsal view of male paratype from Calhoun County, Fla. 1a. Right and left paramere, 1b. right and left apodeme, 1c. aedeagus of male genitalia. Fig. 2.—*Bidessus granarius* (Aubé), dorsal view of male from Alachua County, Fla. 2a. etc., as 1a, 1b, and 1c above. Dotted lines represent non-chitinous portions.

Detailed Description: Oblong, ovate, widest about the middle of the elytra, convex above and below. Dorsum strongly shining, highly polished. Head ridged along the median line with the sides and vertex planate as in *granarius*. Thorax broader than long; ratio of greatest width (at base) to length along middle about 2.4 (about 2.7 in *granarius)*. Elytra widest about the middle, with their lateral margins reflexed and carinate, but not as strongly as in *granarius*. Antennae with the 6th and 8th segments slightly more dilated anteriorly than the others. *Color:* Head and clypeus light fuscous above with the clypeus lighter along the anterior ridge; both

light testaceous below. Antennae light testaceous at the base with the last sex segments fuscous above, but light testaceous beneath. Pronotum very light testaceous (appearing almost whitish) with the base between the plicae and the margins darker, and the apex narrowly margined with fuscous; uniformly light testaceous beneath. Elytra reddish-fuscous; the reflexed margins and epipleurae testaceous. Venter dull, mostly uniformly testaceous with slightly infuscate areas on hind coxae and metathorax. Legs uniformly testaceous. *Punctation and Vestiture:* Head and clypeus above finely, not closely punctate; minutely reticulate; occiput smooth. Pronotum finely, somewhat sparsely punctate with a few fine recumbent hairs. Elytra more coarsely and closely punctate than the head and pronotum; with scattered recumbent hairs; epipleurae coarsely and sparsely punctate. Head and prothorax almost impunctate below. Meta- and mesathorax finely somewhat sparsely punctate. Hind coxae finely, sparsely punctate on the apical two-thirds while the basal third is almost impunctate. Abdominal sternites finely and not densely punctate except on the hind margins and the lateral portions where the punctations are coarser and denser. Length, 1.3 to 1.6 mm.; width, about .76 to .8 mm.

Variation: The series before me varies little except in the coloration, which differs mostly in intensity and in the degree of infuscation of the undersurface. Length and general shape are rather constant.

Holotype Male: Calhoun County, Florida, 9 miles northwest of Blountstown, June 9, 1938, H. H. Hobbs, L. Berner, J. M. Martin, and F. N. Young, deposited in collection of the Museum of Comparative Zoology, Harvard College, Cambridge, Massachusetts.

Paratypes: Thirty males and females, Calhoun Co., Fla., same data as for holotype. Four males and females, Calhoun Co., Fla., 7 miles northwest of Blountstown, June 8, 1938. Six males and females Wakulla County, Florida, June 5, 1938, F. N. Young, *et. al.* The paratypes are in the collections of the M. C. Z., the University of Michigan Museum of Zoology, the United States National Museum, the American Museum of Natural History, and the private collections of Mr. H. B. Leech, Mr. C. A. Frost, and the writer.

I take pleasure in naming the above species for Dr. J. Speed Rogers of the Department of Biology, University of Florida, who has done much to encourage my work on Coleoptera.

A CORRECTION

An unfortunate misinterpretation of catalogue numbers caused me to cite a wrong type locality for *Bidessus falli* Young, described in the FLORIDA ENTOMOLOGIST, Vol. XXIII, No. 2, page 30. The type locality is Madison County, Florida, on the Aucilla River near Lamont, June 4, 1938, collected by the writer. The Alachua County locality given in the original description refers to a specimen of *falli* in the collection of Dr. H. C. Fall in the Museum of Comparative Zoology, Harvard College, Cambridge, Massachusetts.

FRANK N. YOUNG

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OVOVIVIPAROUS MAYFLIES IN FLORIDA[1]

LEWIS BERNER
University of Florida

The phenomenon of ovoviviparity is present in several of the metazoan phyla and is of fairly common occurrence among the Arthropoda. Insects of many species give birth to either nymphs or larvae instead of laying eggs, some parthenogenetically, others with bisexual reproduction. Among the latter are representatives of the Ephemeroptera, Orthoptera, Hemiptera, Lepidoptera, Coleoptera, Strepsiptera, and Diptera.

Ovoviviparity in mayflies has been observed in *Callibaetis vivipara* of South America and *Cloeon dipterum* of Europe. In North America, the production of living young seems to be confined to the genus *Callibaetis*. According to Needham, Traver, and Hsu (1935: 85), a single female of an undetermined species of *Callibaetis*, taken at McLean, New York, in 1924, was found on dissection to contain first instar nymphs 0.6 mm. long; however, this adult was poorly preserved and the immatures were consequently unsuitable for study.

In July, 1939, I collected at a lighted sheet placed near the bank of a clear, calcareous stream, Blue Springs Creek, near Marianna, just below an area which has been dammed to form a rather long lake. Among the many insects which were attracted to my light were numerous specimens of *Callibaetis floridanus*, the nymphs of which, I assume, had lived in the

[1] A paper presented before the Florida Academy of Sciences, November, 1939.

artificial lake across the road from where I was lighting. Since this is such a common species and there seemed to be so many mayflies which I thought would be more interesting, only five females were taken in order to record their occurrence in this particular area.

After returning to the University at Gainesville, I examined this material and found in the bottom of my dish numerous oval-shaped objects which proved on closer study to be well-developed eggs. Opening one, there was revealed a completely formed mayfly nymph. Looking then at the female specimens of *Callibaetis floridanus,* I noted several of these eggs, some apparently with the chorion ruptured, protruding from between the seventh and eighth abdominal segments. These females were probably ready to oviposit when collected and stimulated by immersion in alcohol, had released some of their young.

Following the discovery of ovoviviparity in these five specimens, I examined the remainder of my material of this species and found some females with eggs which appeared to be unfertilized, some with young partially developed, and others with young nymphs fully formed but still within the egg. I believe that, following mating, the females remain quiescent until the eggs have completed development within the abdomen, and that the nymphs are normally released from the eggs at approximately the moment of laying.

The egg is oval shaped with a very thin, transparent chorion. The nymph, tightly coiled within this shell, has the legs folded beneath the thorax, the abdomen bent double so that the legs are concealed, cerci are held beneath and the antennae close against the head. The head is the most prominent feature of the nymph and on it, five dark spots, the developing eyes stand out clearly against the white body. Abdominal segments, mouth parts, and the rather long legs are clearly discernible when a specimen is uncoiled. Gills, of course, have not yet formed and if they behave in this species as in others in which the post-embryonic development has been studied, these structures will probably develop in the second or third instar.

Longevity is probably correlated with ovoviviparity in mayflies. Normally the life span of adults is from a few hours to two to three days, but a female *Cloeon dipterum,* the European ovoviviparous mayfly, was kept alive for twenty-one days. In the summer of 1937, I kept a female *C. floridanus* alive in a paper sack for eight days, a period which I believe would be

more than sufficient for development of eggs to occur. Males of *C. floridanus* die within one to two days after the subimagal molt.

The females of another Florida species, *Callibaetis pretiosus* Banks, likewise contained fully developed nymphs. Furthermore, I found a female *Callibaetis* from Michigan whose abdomen was filled with eggs which were almost ready to hatch. It, therefore, appears likely that many if not all of the species of this genus are normally ovoviviparous.

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A SUICIDE HOST

The blue-tailed skink *(Plestiodon fasciatus)* often called the "scorpion", is a true host of the immature stages of the black-legged tick *(Ixodes scapularis)* in the vicinity of Gainesville, Florida. Two specimens collected in early May, 1939, were infested with a total of 123 larvae and 8 nymphs all of which were alive and in various stages of engorgement. The fence lizard *(Sceloporus undulatus)* often called the pine lizard or swift, is also attacked by the same stages of this tick. Death, however, is the penalty for those that attach to this host. Seven fence lizards collected in the same vicinity and during the same period as the blue-tailed skinks mentioned above, were infested with a total of 42 larvae and 6 nymphs of which 34 of the larvae and 5 of the nymphs were dead and the condition of some of the others indicated that the rest were destined to succumb.

H. HIXSON

TOPPING COTTON IN EARLY FALL AS A POSSIBLE MEANS OF REDUCING THE SPRING BOLL WEEVIL POPULATION IN THE NORTHWESTERN PART OF THE FLORIDA SEA ISLAND COTTON BELT

P. W. CALHOUN

An obvious and prominent factor tending to cause heavy boll weevil infestations in the northwestern part of the Florida Sea Island Cotton Belt is the large number of weevils that develop in the bolls in the upper part of the plants. The writer has seen more than one instance in which it seemed likely that 50,000 or more weevils per acre would emerge from bolls during September and October, judging from the abundance of larvae and pupae in them when the examinations were made. These perhaps were exceptional cases but the development of from 10,000 to 15,000 weevils per acre in areas where soil and climatic conditions favor a continuance of plant growth in the fall is not. If any considerable acreage is planted to Sea Island cotton in such areas the weevil population generally increases to a point where control by means of poison applications is so difficult that farmers discontinue to attempt to grow Sea Island cotton on a large scale.

Last fall a limited series of experiments was instituted for the purpose of developing a practicable method of reducing the fall weevil population in an area such as described. Of the procedures tried, fall topping appeared to the writer to have most promise of accomplishing the result sought.[1]

The topping tests were conducted under the jurisdiction of the Florida WPA Statewide Sea Island Cotton Rehabilitation Program,[2] now discontinued. The area selected for the tests was a part of Madison County in which the weevil infestation was particularly heavy. None of the fields topped had produced more than half a crop, and most of them had produced less. Practically all bolls from the middle of the plants upward contained from two to five weevil larvae or pupae when the topping was begun about September 10, while the tops of the plants were vigorous and producing an abundance of squares. Conditions appeared ideal for the production of a tremendous fall weevil population in each of the fields topped.

[1] A brief press report on the topping tests has been made, (1). (Numerals refer to literature citations.)

[2] This was a cooperative program sponsored by the Florida State Department of Agriculture.

The topping operation consisted in cutting off that part of each plant that contained bolls badly infested with advanced stage larvae or pupae about ten days before the cotton would be ready for the final picking. In most instances about a third of the plants was cut off. The principal idea at the time of topping was to destroy as much of the squaring portion of the plants as possible without discarding any sound bolls. It was realized of course that the few apparently sound small bolls in the heavily infested portion of the plants would be ruined before they reached maturity so no attempt was made to save these. Since the plants were green and soft, the topping was easily done with pocket knives. The total acreage topped was about 200 acres, in some 12 or 15 fields. This area, surrounded by heavily infested untopped fields, was not large enough to constitute a conclusive field test of fall topping, since it is certain that weevils migrated into it in considerable numbers from the outside in late fall, and some overwintered weevils no doubt will migrate into the topped area in the spring. It is also to be noted that the work has been done only during one season. Nevertheless the writer feels that observations made in the topped cotton in the fall are significant and favorable.

As quickly as the discarded tops died the adult weevils feeding on them moved to the live portion of the plants. In a few days the few squares remaining on the plants were so riddled with feeding punctures that they were practically worthless as food. For several weeks young squares were killed by feeding punctures before they were large enough to furnish much food. All bolls that were not practically ready to open were attacked heavily by weevils that appeared to be starving for food, moisture, or both. However, no appreciable damage to the bolls resulted. When the plants were topped the weevil population had already been high several weeks and thus practically all sound bolls were tough, fibrous, and almost ready to begin to open. It is of course obvious that topping heavily infested cotton while a large number of sound bolls are tender would cause heavy boll damage from weevil attack, and in some instances it might cause bolls to fail to mature properly, resulting in the production of weak lint.

Beginning about two weeks after topping, adult weevils appeared to become less and less numerous in the fields until only a few remained. Whether the majority of them died or migrated is not known. It was certain, however, that for several weeks

before frost the weevil population in the topped field was low. Moreover, there was a relatively small amount of palatable food, such as fresh foliage, squares and blossoms, on which they could feed.

One of the surprises encountered was the extent to which the immature weevil stages died in the young bolls on the removed tops. All except the large almost rotten bolls dried into hard leathery knots and most of the immature weevil stages in them perished. It is not known what the percentage of emergence from these bolls was, but it was a great deal lower than it would have been had the tops remained on the plants.

Apparently the weevil-damaged, but not completely ruined, bolls on the live portion of the plants opened quicker and more fully as a result of the topping, which seemed to result in less waste cotton being left in the field on the final picking. It is thought probable that enough extra cotton was thus harvested to more than pay for the topping operation. Naturally the cotton picked from these damaged bolls was badly stained.

Considerable data have been accumulated in the past which the writer interprets as indicating that very probably an abundance of squares and blossoms in the fall enhance the weevil's chance of surviving the winter, although so far as he knows this has not been demonstrated as a certainty. Hunter and Hinds (3) reported that over-wintered female weevils do not oviposit when deprived of squares, and also reported greater longevity for weevils fed squares than for weevils fed other parts of the plant. Isley (4) reported that females oviposited much more freely when fed squares than when fed bolls. He also stated (5) that weevils are more numerous in the spring in areas where cotton squared freely the previous fall, but he apparently attributed this to a greater fall population which would be found where an abundance of squares was produced. Grossman (2—page 17) suggested the possibility that a scarcity of squares in the fall might explain an apparently shortened longevity in certain hibernation tests. It is well known that weevils do not long remain abundant in cotton in the fall after squares have disappeared. Apparently they either largely die out or migrate in search for cotton containing an abundance of squares.

While employed by the Florida Agricultural Experiment Station the writer conducted a series of feeding experiments (data unpublished) in which weevils newly emerged from squares were divided in lots and fed exclusively on one of three diets, viz:

(A) Small tender cotton leaves, (B) mature but green healthy leaves or (C) cotton squares. On each of these diets some of the groups were fed 5 days, some 10 days, some 15 days, and some 20 days. Each weevil was kept in an individual container and weighed daily. At the expiration of the feeding period they were preserved in 70% alcohol for crude dissection, principally to determine roughly the relative development of the ovaries or testes for the several groups. About 400 weevils completed the feeding tests and were dissected. The notes taken are not at present available, but several factors stood out plainly and can be reported from memory.

The gain in weight was about equal for each diet, but it was somewhat more rapid for weevils fed squares than for the foliage fed groups, especially during the first few days. The ultimate gain was about 20% of the original weight of the weevil, and most of the gain took place during the first ten days of the feeding period. The average length of life for the three diets, as judged by the percentage of weevils still alive at the expiration of the feeding periods, did not differ markedly, but was greatest for the square fed groups.

However, while removing the elytra during the dissection operation it was noted that the elytra of weevils fed foliage were much more fragile than those of weevils fed squares. A large number of the removed elytra were weighed, and it was found that those of square fed weevils were considerably heavier than those of foliage fed weevils. This would seem to indicate a definite physiological deficiency in the case of the foliage fed groups.

The ovaries and testes of square fed weevils developed much more rapidly, and final development appeared much more complete, than those of foliage fed weevils. The writer would not judge from the appearance of the ovaries of the foliage fed weevils that they could have oviposited normally.

At the end of the feeding period, the weevils were dropped in the alcohol alive. When removed for dissection it was noted that in the case of the square fed groups a considerable percentage of the ovipositors protruded from the bodies of the females, while none protruded in the case of the foliage fed weevils. The significance of this was not understood.

In instances in which the weevils were stored any considerable period before being dissected, the abdominal tissues of the foliage fed weevils appeared darker and more fragile than did

the abdominal tissues of the square fed weevils. This was thought to be due to a higher fat content for the latter than for the former, though no tissue analyses were made to verify this supposition.

In another series of experiments [3] field captured adults were placed individually in containers and were given access to water but not to food, and each weevil was weighed daily until death. It was noted that a low and moderately constant mortality rate prevailed, generally speaking, until the weevils lost about 15% of their body weight, after which the mortality rate for the group increased rapidly. Very few of the weevils remained alive more than a few days after losing 20% of their weight. Loss of weight was generally slow and regular until two or three days before death but for the last few days of the weevil's life loss of weight often became irregular and rapid, probably because they would be weak not consuming water.

When the number of weevils alive each day was graphed on a semi-logarithmic scale the curve produced bore considerable resemblance to graphs published by Grossman (2—page 14) portraying mortality curves of field captured weevils stored in Spanish moss in chilled constant temperature compartments. The feeding and longevity tests discussed above were conducted at room temperature during the summer and early fall of 1933. The weevils were kept in the cooler parts of the room, however, so they were never very active. The average life of the field captured weevils under these conditions was about 30 days.

While the above evidence as to the importance an abundance of squares in the fall might have in enabling the weevil to survive the winter is admittedly indirect, when viewing it in the light of a great many field observations in many parts of Florida, the writer feels constrained to believe that very likely it is a factor of no small consequence. If so, the scarcity of squares in the topped fields during the fall without doubt decreased very considerably the percentage of survival of the relatively few weevils that remained in them. If this is true, the combined factors of fewer weevils emerging in the fall and a reduced percentage of survival over the winter should go far towards preventing such extremely heavy spring weevil populations as now are common in some areas in the northwestern part of the Florida Sea Island Cotton Belt, provided a large majority of growers in these heavily infested areas can be induced to top

[3] This experiment was suggested by a laboratory assistant, R. A. Graff.

their cotton in the fall as soon as it is safe to do so without danger to the sound bolls, that is, about ten days before they intend to commence the final picking.

As a final precaution, however, the writer wishes to state that he does not consider the experiments here reported to be justification for a recommendation to top Sea Island cotton indiscriminately. In the central and southern parts of the Florida Sea Island Belt early picking followed by the destruction of the stalks is undoubtedly much better than fall topping. In the northwestern part of the belt, however, it has not yet been demonstrated that Sea Island stalks can be destroyed sufficiently early in the fall to prevent heavy infestations the following spring, though no doubt they could be reduced appreciably by this means. It is in the northwestern part of the Florida Sea Island Belt that the writer believes fall topping might prove especially beneficial by considerably reducing what would otherwise be extremely heavy spring weevil populations. At present these very heavy populations make control by poison applications, for the average Sea Island Cotton grower at any rate, impracticable.

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MIGRATIONS AND FOOD PREFERENCES OF THE LUBBERLY LOCUST[1]

J. R. WATSON

We spoke at last year's meeting of the breeding grounds and remarkable migrations of the young Lubbers to neighboring narcissus fields at Doctor's Inlet. We pointed out that the

[1] Paper given before the Florida Entomological Society. December 13, 1940.

breeding grounds where the females lay their eggs are restricted to rather narrow limits as to the character of the soil; that they avoid alike as a place for oviposition the lower, more compact soils of the flatwoods and the extremely dry, sandy soils of the scrub or long-leaf pine-turkey oak association. Their favorite soils are the upper edges of the flatwoods where the pines are beginning to be mixed in with live oaks. There is usually but little suitable food for the young hoppers in this plant association and when a week or so old there is a heavy and almost complete migration, doubtless induced by need of more succulent food. As pointed out last year this migration is almost complete. A week or ten days after the last hoppers have hatched there will be very few left on the original breeding grounds.

The hoppers are quite generally found in low and swampy land where they cannot possibly have hatched. Doctor Tissot called our attention to such a colony just this side of Cedar Keys last summer. It was evident that they could not have hatched there, but within an eighth or a quarter of a mile there were what appeared to be suitable breeding grounds although at that date no hoppers were found in these dry situations. As pointed out last year the hoppers migrated toward a narcissus field at Doctor's Inlet to the northeast of the breeding grounds and approximately a quarter of a mile away from the center of the grounds. They traveled in definite trails and there were fifteen of these trails within one-fifth of a mile over an asphalt road. We expressed the opinion that they must have located the narcissus by smell or kindred sense. This year that field was not planted to narcissus, but a field adjoining the breeding grounds on the west was planted and this year the migration was not to the northeast as last year's, but almost due west, again towards the narcissus field. As was the case last year they practically all left the breeding grounds by the time they were a week old. This migration is not a haphazard scattering in all directions, but a very definite movement along definite trails toward the field of narcissus. In one trail this year there were about seventy-five hoppers per yard of the trail which was only two or three inches wide, but extended the full length from the breeding grounds to the narcissus field. Hatching and breeding this year were about two weeks later than last year, due undoubtedly to the cold, damp spring.

Mr. Bratley took up the problem of feeding the hoppers at Gainesville on different food plants. Some were raised on nar-

cissus, others on tread-softly, others on poke berries, and still others on a mixture of grasses and weeds growing in an uncultivated field on the Station grounds. By June 26th about nine-tenths of those fed on narcissus had become adults; a few of those fed on tread-softly were also adults, but comparatively few of those that were fed on the mixture of grasses and weeds had completed their growth. Those fed on poke berries were intermediate. Also a larger proportion of those fed on narcissus lived to maturity. It is thus seen that the character of the food has much to do with the rapidity of development and the number that reach maturity. The hoppers all came from the same batches of eggs. Of the different foods tried, the most favorable was narcissus; the second, tread-softly, a plant, by the way, not at all related to narcissus; the third, poke berries, again very different botanically; and the poorest of all those fed were the grasses and weeds. If offered a choice of the four in a cage, the hoppers would first consume the narcissus, then tread-softly, then poke berry. It is thus seen that there is truth in the contention of the farmers that neighboring fields of narcissus do cause a marked increase in the amount of Lubberly Locusts in the neighborhood where no measures are taken to combat them.

As during last year a ditch as much as a foot deep with straight, steep sides made an effective barrier for the migrating hordes. This year the main breeding grounds at Doctor's Inlet was burned over during the time of the active hatching of the hoppers with a very marked effect on their numbers. If the hoppers emerged more uniformly in time, this burning of the fields just after the eggs had hatched would be a very effective means of control. It would take a very hot fire to kill the unhatched eggs or nymphs in the ground. The grower at Penney Farms who last year took active measures against the hoppers suffered very little damage this year, whereas last year the damage was severe.

In addition to the host plants mentioned above they were about as fond of crinums as of narcissus. They fed on gladiolus, but much less eagerly than on narcisus or crinums; for day lilies, they did not seem to care. In the swamps their favorite foods were Pickerel Weed, Cyperus (a sedge), Lizards' Tail *(Saururus)*, and Sagittaria. They were seen also feeding on the flowers of Chamaecrista.

ARTHUR PAUL JACOT

Arthur Paul Jacot was born on Staten Island, New York, March 28th, 1890. As a child he attended the Staten Island Public Schools; Mount Hermon School, Mount Hermon, Mass., was his Preparatory School, and Cornell was the college of his choice because there he was allowed to elect all those subjects in biology and natural history which attracted him most and of which he had been deprived in his classical preparatory school training.

He graduated from Cornell in 1917 with a B.S. While a senior at Cornell, he did some summer research work at the U. S. Bureau of Fisheries, at Beaufort, North Carolina. In 1918 he was married and shortly after took charge of the shell collection at the American Museum of Natural History in New York City, which position he held until August 1920, when he sailed for China to teach Biology at Chee Loo University, Tsinanfu, Shantung, China. While on furlough in 1925-1926 he secured his M.A. degree from Columbia University. In 1931 he returned from China and registered as graduate student at Yale University, studying under Professor Petrunkevitch. In the autumn of 1932 he registered at Cornell and there finished the work required for a Ph.D. which he obtained in 1933.

For six months he worked on Dutch Elm Disease in White Plains, N. Y., after which he went to Asheville, North Carolina, where for two years he was connected with the Appalachian Forest Experiment Station. There he did some pioneer work on the fauna of the forest floor in connection with soil erosion control. In 1937 he was appointed by the U. S. Forest Service to the Northeastern Forest Experiment Station at New Haven, Conn., where he continued his forest floor research until his death on March 24th, 1939.

He published about 120 scientific and professional articles and papers.

Scientific and Professional Papers by Arthur Paul Jacot

1. Christmas Bird Census, Monroe, Conn., Bird Lore 1914
2. "Whisper" Song of Birds, Bird Lore 1914
3. Method of Tabulating Notes, Bird Lore 1914
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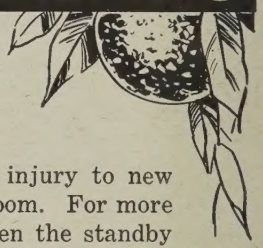

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